Exploring the Roles of Social Networks and Absorptive Capacity in Local Firms' Strategic Flexibility: An Empirical Investigation of Chinese Firms

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In an era of VUCA, strategic flexibility may play a greater role for a company to achieve competitive advantage than innovation. Based on an integrated social network and absorptive capacity perspective, this article proposes a conceptual model in which the local firm's strategic flexibility is affected by its position in global production network and its internal absorptive capacity. Using a sample of 276 local manufacturers located in the Yangtze River Delta, China, the roles of social networks and absorptive capacity in strategic flexibility are identified, and the results indicate that by occupying a central and strong-tie-abundant network position, local firms can gain more resource flexibility; and absorptive capacity possessed by a local firm plays an active role in coordination flexibility.

Keywords: Social networks, network centrality, tie strength, absorptive capacity, strategic flexibility, global production networks, local firms

Introduction

With the acceleration of the globalisation of manufacturing industry, the regional and even Global Production Networks (GPNs) have been formed and developed under the impetus of market changes and technological progress (Sydow et al., 2021). In recent two years, the outbreak of various global crisis represented by the COVID-19 pandemic has caused enormous impact on the GPNs, which were previously considered as stable and sustainable. Currently, GPNs dominated by

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global brand leaders have acted as catalysts for international knowledge diffusion, providing new opportunities for local suppliers' capability formation in low-cost locations outside the traditional Western industrial heartlands (Ernst & Kim, 2002; Fuller & Phelps, 2018). Local suppliers from emerging economies have been highly involved in fierce competition with other firms from around the world in their local markets under an increasingly dynamic and complex environment (Dodge, 2020; Fan et al., 2013; Lin et al., 2014; Witt & Redding, 2013). When local suppliers embedded in GPNs were exposed to exogenous shocks, which may occur more and more frequently on a global scale, some companies functioned poorly or even went bankruptcy, while others showed an extraordinary resilience. The COVID-19 outbreak not only exerted profound influence on the socioeconomic environment, but also reshaped corporate behaviour indeed. When confronted with ever-changing market, financing and political environment, companies may rely more on their capabilities of adjusting and adapting to achieve competitive advantage than the mainstream innovation paradigm, which attracted a heated debate in recent years for its unsustainability and exclusivity (Heeks et al., 2014). The term 'strategic flexibility' has been widely used in strategy-related studies to describe a firm's abilities to respond to various demands from dynamic competitive environments (Brozovic, 2018; Sanchez, 1995). Although there are many means by which a firm can achieve a competitive advantage, two of the most important in dynamic markets are innovation and strategic flexibility (Miroshnychenko et al., 2021; Wei et al., 2014). Thus, strategic flexibility, which emphasises the adjustability of firm resources and the organisational structure, is deemed to be an important element to gain a competitive advantage for local firms (Brozovic, 2018; Fan et al., 2013; Guo & Cao, 2014; Shekarian et al., 2020).

The realistic situation of China has provided an ideal research circumstance. Currently, Chinese local suppliers suffered a 'two-way extrusion' from both the global brand leaders from developed countries and the catching-up enterprises from emerging economies. This research will closely be combined with the reality of China's manufacturing industry, which is known as the world factory, intending to explore how the emerging GPNs impact on local firms' strategic flexibility and to help us better understand the influence mechanisms of strategic flexibility through the lens of knowledge transfer from networks to local firms, in order to provide a valuable and constructive theoretical frameworks and managerial suggestions for the booming local firms participating in GPNs. In this ever-changing competitive environment full of uncertainty and risk, the only certain thing to local suppliers is to improve strategic flexibility and sustainably acquire abilities from the dynamic and fierce competitive environment.

Literature Review

The theory of strategic flexibility has experienced three stages: germination, growth and deepening (Brozovic, 2018). In the germination stage, the option method is an important tool to analyse strategic flexibility. Some scholars establish

a rigorous mathematical model to describe the strategic flexibility and analyse the possible set of strategic choice (Sanchez, 1995). Overall, the main contribution of the germination stage is to break the stable business environment hypothesis and point out the strategic flexibility for enterprises in turbulent environments. In the growth stage, the related research further defines the connotation of the construction and makes up for the deficiency of the resource view and the ability view in explaining the competitive advantage of the enterprise (Zhou & Wu, 2010). In the deepening stage, scholars have begun to emphasise the strategy of market-oriented flexibility, pay more attention to the enterprise reflected in the market competition behaviour of strategic flexibility, focus on customers' needs, competitors, organisation coordination and other specific aspects to consider the concept of strategic flexibility and measurement problems, beyond the abstract analysis of enterprise resources and ability and gradually developed into the concept of accurate empirical operation (Claussen et al., 2018; Johnson et al., 2003; Nadkarni & Herrmann, 2010).

The extant literature on strategic flexibility investigates the theoretical origin, the connotation, the measures of strategic flexibility and the relation between strategic flexibility and firm performance (Sanchez, 1995; Sanchez & Mahoney, 1996; Sánchez & Pérez, 2003; Turner, 2012). In fact, a consensus that was previously achieved by existing studies is that strategic flexibility, which contains two main aspects of resources allocation and competitive behaviours, further represents the resource-based view and the dynamic capability theory (Zhou & Wu, 2010). On this basis, further literature on strategic flexibility evolves into different schools of thought (Herhausen et al., 2021). Certain studies highlight the important role of external factors in promoting strategic flexibility, for instance, the turbulent task environment, correlative dependence across subsystems and relation with buyers and organic structures (Nemetz & Fry, 1988). In contrast, others focus on the dominance of internal factors, for example, the cognitive dimension of the management team (Shimizu & Hitt, 2004) and technological capability (Zhou & Wu, 2010). Given that local firms' behaviours and capabilities are often socially constructed, this article argues that local firms' strategic flexibility is influenced by their social networks and absorptive capacity in GPNs.

On the one hand, most firms from emerging economies are located at the periphery of the GPN. However, there remain a few firms that may upgrade and occupy a relatively central position in the GPN. Those firms occupying a better position may have advantages in adjustability (Owen-Smith & Powell, 2004). The disparity of the position results in tremendous differences, which appear in a series of behaviours, such as obtaining and applying resources from the network as well as adopting strategic behaviours (Peng & Wu, 2013). On the other hand, scholars from capability research argue that the network theory neglected the firm's internal absorptive capacity in acquiring and applying the external resources that will lead to different strategic behaviours (Fernández-Pérez et al., 2016). Confronted with a turbulent environment, how to effectively construct and improve a firm's strategic flexibility through utilising resources in the GPN and

enhancing its absorptive capacity become significant both theoretically and practically (Dobrzykowski et al., 2015; Tsai, 2001).

To fill these gaps, we propose that an external social network (i.e., embeddedness in GPNs) is a platform for the local firm to acquire resources and information around the world; this can be connected with the internal organisational capacity (i.e., absorptive capacity) to construct an organic combination and therefore help the local firm to improve its strategic flexibility in coping with a dynamic and complex environment. Based on the social network and absorptive capacity perspective, we attempt to complement the extant body of knowledge on strategic flexibility by positioning local firms in the GPN and determining the role of absorptive capacity in integrating and interacting with the external environment, thereby reinforcing internal core competitiveness. Then, we attempt to contribute to the literature on firm strategy in emerging markets by emphasising the important roles of absorptive capacity and embeddedness in GPN in improving local firms' strategic flexibility in a turbulent environment. Empirically, we will test these relations with a sample of local manufacturers that are located in the Yangtze River Delta in China.

Theory and Hypothesis

Social Networks and Strategic Flexibility of Local Firms

From the perspective of social networks, firms are embedded in a network in which suppliers, customers, competitors and other external organisations interact with each other (Allee & Taug, 2006). The relations between firms and external organisations further evolve from independent dyadic relations into interdependent network relations. Moreover, the resource sharing among firms in the networks is significantly enhanced with trust being increased and uncertainty being reduced (Yang et al., 2010). In general, the major factor that influences firm behaviours and performance in the network is the network position (Zaheer & Bell, 2005). To systematically select variables that reflect conditions, this study examines a network position with two indicators: network centrality and tie strength. We discuss the concept of centrality because it refers to the locations of positions or points in networks (Freeman, 1978).

Strategic flexibility is a critical research concept in product competition, which depends jointly on the resource flexibility of a firm's available product creation resources and coordination flexibility of the firm in using its available resources in product markets. This decomposition of strategic flexibility to develop the concepts of resource flexibility and coordination flexibility in product competition is from the theoretical perspectives of strategic flexibility perspective and resource-based view of competition (Grant, 1996). Resource flexibility reflects the effect of new product creation resources in developing, producing, distributing and marketing products, while coordination flexibility reflects the firm's ability to effectively use those resources by means of organisational structures and new

product strategies. The interaction of resource flexibility and coordination flexibility is reshaping the competitive environments in existing product markets, and it develops the new product strategies, organisational forms and competitive logic for dynamic market competition (Sanchez, 1995).

Network Centrality and Resource Flexibility

In general, a firm is highly central in its network if it has a large number of connections with other firms (Scott, 1991), which implies that the central firm is in 'demand' as a relationship partner. Occupying the GPN's central position provides local firms with access to partners' innovation resources, which the local firms then utilise because these central firms are deemed to be favourable resources in various cooperative relations and are highly desired by other firms (Ahuja, 2000; Battilana & Casciaro, 2012). In accordance with the resource dependence theory (Hillman et al., 2009), firms are always devoted to establishing various relations for the sake of gaining critical resources. In this view, an inter-firm linkage is viewed as an avenue for resource flow, and a well-placed firm can potentially draw upon the resources of its partners. Although it is acknowledged that potential access to resources need not always result in actual access, this hypothesis is in accordance with previous research that asserts that highly central firms have greater access to external resources. Thus, the higher the network centrality, the wider the quantity of potentially accessible resources and therefore the higher the resource flexibility.

H_1: A local firm's network centrality in GPNs has a positive impact on its resource flexibility.

Network Centrality and Coordination Flexibility

The more central the firm, the more 'active' it is; the central position in the GPN facilitates the reconfiguring of local firms and applying their original innovation resources (Grossman et al., 2012), leading to a great competitive scrutiny of the local firm. A firm that has initiated, or is the recipient of many relationships, is likely to attract attention from analysts and competitors searching for underlying rationales and signalling implications (Madhavan & Prescott, 1995). Moreover, the more central the local firm in the GPN, the higher the number of potential information leaks and pressure points for the competition to attack. Each relation should be observed not only as potential opportunities for signalling strategic intentions but also for the 'bleed through' of unintended information to partners who are often competitors as well. Thus, in a dynamic GPN that require frequent adjustments in product strategies, network centrality interferes with the flexibility of local firms in coordinating the uses of product creation resources.

H_2: A local firm's network centrality in GPNs has a negative impact on its coordination flexibility.

Tie Strength and Resource Flexibility

Tie strength is an important dimension that refers to a dyadic interrelation between actors in the interwork; in view of this, this study chooses credibility, information sharing and joint problem solving as the embeddedness mechanisms (Uzzi, 1997). The first reason is that credibility encourages firms to openly accept collaborative partners in the GPN. Therefore, credibility will benefit firms by acquiring more accurate and reliable information and higher quality resources from partners and then deepening the use of these complementary resources. Second, with the development of information sharing, information exchange between collaborative partners and local firms will become more frequent, elaborate and complex (McEvily & Marcus, 2005). During the interaction process, it is most likely for firms to gain unexpected resources and information, which enhances the possibility and convenience of utilising innovation resources (Blomstrom & Kokko, 2001).

H_3: A local firm's tie strength in GPNs has a positive impact on its resource flexibility.

Tie Strength and Coordination Flexibility

The reaction of competitors to strategic moves is based on a variety of factors, one of which is the ease of 'reading' the intent behind the move. The profile of a local firm's relationships with its partners is a major source of information to analysts who use this data to deduce strategic intents on the part of firms (Madhavan & Prescott, 1995). It may be argued that a strong relationship to current partners suggests an implied commitment to the current strategy. For example, resources that are locked in by a relationship are unlikely to be released easily to counter a new competitive threat. This behaviour points to a limited range response to competitors' actions and to easier 'predictability'. Thus, it is argued that a firm that is highly embedded will be easier for competitors to understand and predict and will therefore attract stronger and more focused retaliation.

H_4: A local firm's tie strength in GPNs has a negative impact on its coordination flexibility.

Absorptive Capacity and Strategic Flexibility of Local Firms

Cohen & Levinthal (1990) have offered the most widely cited definition of absorptive capacity; absorptive capacity in the knowledge management capacity framework is composed of the process stages of acquiring external knowledge and assimilating this knowledge by means of incorporating it into the firm's knowledge base (Zahra & George, 2002). As noted, the position in the GPN, as an external factor for firms, provides many critical resources for firms, whereas how to effectively acquire and apply external resources depends on a firm's internal absorptive capacity. Next, this study will focus on exploring how a firm's absorptive capacity,

as an internal factor, affects its strategic flexibility. Specifically, absorptive capacity can help firms gain new external knowledge, increase knowledge accumulation and apply shared knowledge to a product innovation strategy (Liu et al., 2019). Hence, we mainly consider the promotion mechanisms of a firm's absorptive capacity on strategic flexibility through both knowledge acquisition capabilities and knowledge application capabilities dimensions.

Absorptive Capacity and Resource Flexibility

Knowledge acquisition capabilities denote the firm's capabilities to search for external knowledge. Moreover, these capabilities recognise and assess the value of new information. For the purpose of developing a resource flexibility system, local firms are required to enhance their absorptive capacity; this results in gaining more market knowledge, technology knowledge and production knowledge from global brand leaders. In this regard, during the process of obtaining and increasing both knowledge and information, local firms also accumulate social capital (Nahapiet & Ghoshal, 1998), as well as achieve a better production efficiency and an enhanced R&D ability to continuously yield products with strong market competitiveness. Consequently, firms with stronger knowledge acquisition capabilities prefer to invest in resource flexibility, targeting discovery and allocating these business opportunities.

In accordance with Zahra & George (2002), knowledge application capabilities refer to a firm's ability to internalise, converse, use and implement the available knowledge. Stronger knowledge application capabilities imply better communication and more mutual consensus; at the same time, it means a greater likelihood of the combination of external information and firm resource attributes. Therefore, the more likely that the control of the resources is settled by a local firm's formal institutional arrangement that can integrate both a resource's particular attributes and its market demand perfectly, the more likely innovations, such as new product development, will be successfully implemented.

H_{5a}: A local firm's knowledge acquisition capabilities have a positive impact on its resource flexibility.

H_{5b}: A local firm's knowledge application capabilities have a positive impact on its resource flexibility.

Absorptive Capacity and Coordination Flexibility

Local firms with better acquisition capabilities prefer to scan their external environment and internalise this knowledge to continually improve their knowledge base. Moreover, these capabilities can help local firms to develop well and to redeploy necessary capabilities, such as technology and production, at the right time by tracking changes in their industries more effectively (Zahra & George, 2002). Further, the firms having strong knowledge acquisition capabilities can reduce the investments that are sunk into changing the local firm's resource positions because local firms gain experience more effectively, and the costs associated with capability

development decrease overtime. The costs of change are likely to be low when firms have accumulated adequate knowledge and prior experience with the new knowledge or skill base (Zott, 2003). Local firms that are flexible in using their resources and capabilities and can reconfigure their resource bases to capitalise on emerging strategic opportunities (Raff, 2000).

Knowledge application capabilities are likely to influence local firms' coordination flexibility through product and process innovation. Local firms require knowledge leveraging and recombining skills to pursue product line extensions or new product development (Mathews, 2006). Knowledge application capabilities encourage the process of bricolage, help firms to develop new perceptual schema or changes to existing processes and convert knowledge into new products (Kogut & Zander, 1996). Further, they improve firms' adaptability, whereas absorptive capacity encourages staff and top management teams to accommodate environmental changes, both of which increase the firm's strategic flexibility. In other words, if a firm has great knowledge application capabilities, it will actively respond to the changing environment and will grasp market opportunities. Either the firm's ability to identify and grasp opportunities, or the time and costs spent in response to environmental changes, reflects a firm's coordination flexibility. Thus, knowledge acquisition and application capabilities could lead to strategic flexibility when a local firm's resources are properly deployed.

H_{6a}: A local firm's knowledge acquisition capabilities have a positive impact on its coordination flexibility.

H_{6b}: A local firm's knowledge application capabilities have a positive impact on its coordination flexibility.

Methodology

Sample and Data Collection

Although the literature on networks offers frameworks for how to measure network relevant variables using second-hand data; for example, Ibarra (1993) offered a real network approach that may guide the data collection. In this study, our research strategy is conducting a survey. Given that few Chinese firms disclose detailed information regarding their cooperation in financial reports, this study has to develop questionnaires to collect relevant first-hand data from the Chinese local firms directly by using self-report methods. Referring to suggestions in the literature, such as Hinkin (1995), we conducted a pilot study with five firms from the economic development zones in the Yangtze River Delta prior to the formal survey; based on this, we further refined those questionnaires.

From April to July 2020, with the first wave of the pandemic being well controlled in China and resumption of production being carried out in an orderly manner, questionnaires were distributed to respondents who are upper- and mid-level managers within the sample firms; the questionnaires were then collected via three channels. Fifty copies of the questionnaires were released at the scene; 200

copies of the questionnaires were provided to the government agencies and public institutions of industrial economics for further issuance to the sample firms and other 200 copies of the questionnaires were released to executives who also attended EMBA classes at a renowned university in Yangtze River Delta. In total, 450 copies of the questionnaires were distributed, and 328 copies were collected. Among those total copies, there were 276 effective copies for an effective response rate of 61.3%.

The higher the response rate, the lower the likelihood of a non-response bias in play. We used non-response follow-up to test the non-response bias. Therefore, we conducted a telephone survey of 100 randomly selected non-respondents to determine whether there were any systematic differences between our sample and the rest of the population. The t-tests were carried out for differences in the means of participating and nonparticipating firms on certain key variables. We did not find any significant differences in the means. Hence, we believe that the threat of non-response questionnaire bias could be omitted. Addressing the major reasons for the discrepancy of responses, we have taken relevant control measures to obtain more accurate answers. To minimise the problem of common method bias except statistical testing, all the items in the questionnaires were listed randomly and expressed in a clear and practical description. Besides, all the questionnaires were designed to be filled anonymously. We also conducted ANOVA and found no significant differences among data from those three survey participant channels. Table 1 represents the descriptive statistics of sample firms.

Table 1

Descriptive Statistics of Sample Firms (*N* = 276).

Attribute	*Characteristics*	*Percentage %*
Firm age	Less than 5 years	15.3%
	6–10 years	27.7%
	11–20 years	36.4%
	More than 20 years	20.6%
Firm size	Less than 300 staff	48.5%
	301–2,000 staff	26.5%
	More than 2,000 staff	25.0%
Firm sales (in RMB)	Less than 5 million	12.1%
	6–30 million	22.1%
	31–300 million	32.7%
	More than 300 million	33.1%
Firm ownership	Private enterprises	58.8%
	State-owned enterprises	15.4%
	Collective-owned enterprises	6.6%
	Foreign-funded enterprises	15.8%
	Other types of enterprises	3.3%
Industry	Machinery manufacturing industry	22.8%
	Chemical product and fibres manufacturing industry	8.5%
	Transport equipment manufacturing industry	9.6%
	Electronics and telecommunications manufacturing industry	18.0%
	New energy, new material and new medicine industry	13.9%
	Software industry	12.9%
	Other industries	14.3%

Dependent Variables

Strategic flexibility depends jointly on the inherent flexibilities of the resources available to the firm and on the firm's flexibilities in coordinating the use of those resources to alternative courses of action. We adopt the measurement of resource flexibility and coordination flexibility from Sanchez (1995). The resource flexibility can be characterised through the three dimensions of resource 'use' that are applicable to product competition. In dynamic product markets that require frequent adjustments in product strategies, the flexibility of coordinating the uses of product creation resources consists of flexibilities to redefine product strategies, reconfigure chains of resources and redeploy the reconfigured chains of resources. The coordination flexibility of the firm to pursue alternative product strategies depends on achieving concurrent flexibilities in all three processes (Sanchez, 1995). The three scale items of resource flexibility and the three scale items of coordination flexibility use seven-point Likert scales, with anchors between 'strongly disagree' to 'strongly agree', refer to Table 2.

Table 2

Survey Measures, Loadings and Corrected Item-Total Correlation.

Constructs	*Survey Measures*	*CITC*	*Loading*
Network centrality	A11. We are important sources of communication within the networks.	0.563	0.739
	A12. We are important sources of advice within the networks.	0.638	0.835
	A13. We are important sources of support within the networks.	0.668	0.770
	A14. We are important sources of influence within the networks.	0.609	0.776
Tie strength	A21. Our main partner keeps its word.	0.707	0.614
	A22. Our main partner does not mislead us.	0.635	0.726
	A23. Our main partner shares its plan for the future with us.	0.737	0.789
	A24. Our main partner shares proprietary and sensitive information with us.	0.768	0.818
	A25. We work with our main partner to help solve each other's problems.	0.764	0.795
	A26. Our main partner works with us to overcome difficulties.	0.711	0.713
Knowledge acquisition capabilities	B11. We acquire new technological expertise from our foreign parents more than others.	0.752	0.823
	B12. We acquire new marketing expertise from our foreign parents more than others.	0.797	0.885
	B13. We acquire new managerial techniques from our foreign parents more than others.	0.785	0.835
Knowledge application capabilities	B21. We apply foreign parent's knowledge in developing new products more effectively than others.	0.783	0.851
	B22. We apply foreign parent's knowledge in a broad product line more effectively than others.	0.756	0.890
	B23. We apply foreign parent's knowledge in strong influence over the channels of distribution more effectively than others.	0.756	0.830

(*Table 2 continued*)

(*Table 2 continued*)

Constructs	*Survey Measures*	*CITC*	*Loading*
Resource flexibility	C11.There is a larger range of alternative uses to which a resource can be applied than others.	0.751	0.848
	C12. The costs and difficulty of switching from one use of a resource to an alternative use (i.e., from one product to another) are lower than others.	0.753	0.855
	C13. The time required to switch to an alternative resource use (i.e., from one product to another) is lower than others.	0.728	0.823
Coordination flexibility	C21. We do better in redefining the firm's product strategies in terms of which products the firm intends to offer and which market segments it will target.	0.699	0.858
	C22. We do better in reconfiguring chains of resources and the firm can use in developing, manufacturing, distributing and marketing its intended products to targeted markets.	0.735	0.847
	C23. We do better in redeploying resources through organisational structures that support the firm's product strategies.	0.693	0.849

Notes: Disagree–agree scale: 1 = 'strongly disagree', 7 = 'strongly agree'.

Independent Variables

The scale of network centrality is developed in accordance with the discussion and measures of Ibarra (1993). The researcher used five items, communication, advice, support, influence and friendship, to describe the network centrality; we adopt the first four items, which measure network centrality at the inter-organisational level, and delete the item of friendship, which can solely be measured at the inter-personal level. The connotation of tie strength is referred to Uzzi (1997)'s pioneer work on embedded ties from three aspects: trust, fine-grained information transfer and joint problem-solving arrangements, and we use the scales of inter-organisational trust, information sharing and joint problem solving developed by McEvily & Marcus (2005) to measure tie strength. In accordance with Lane et al. (2001), the knowledge that local firms acquire from their foreign parents in GPNs has five types: (1) new technological expertise, (2) new marketing expertise, (3) managerial techniques, (4) product development and (5) manufacturing process. Because local firms already have strong capabilities in product development and manufacturing processes, the knowledge acquisition capabilities are evaluated through the first three items. Lane et al. (2001) also noted that the capabilities to apply foreign parent's knowledge are as follows: (1) developing new products, (2) a broad product line, (3) strong influence over the channels of distribution, (4) promotion and advertising expenditures above industry average, (5) extensive customer service capabilities and (6) highly trained personnel. We adopt the effectiveness of the first three items to measure knowledge application capabilities of local firms because the capabilities of marketing, service and talents are deeply controlled by the global brand leaders and local suppliers focus more on the role of production.

Control Variables

To control extraneous variance, we choose two firm-level control variables: firm age and firm size. As usual, the firm age is measured by years since the establishment of the firm; at the same time, the logarithmic form of the firm's sales revenue is used as a proxy for the firm size.

We choose one network-level control variable: network size; this is the number of ties to which firms connect directly. Burt (1992) argued that it is possible for firms to enjoy resources and information benefits at lower costs in a larger network. Information benefits are present in three forms: access, timing and referrals. In other words, firms in the network can establish relations via a third party. The more ties in the GPN, the more conduits for resources there are. Thus, firms with a greater network size and more relations are certainly regarded as having an advantage because there will be growing resource sources, timely valuable information and knowledge and opportunities to share and complement resources. We ask firms to declare how many partnership connections they have to measure network size. Items of network size anchors from 1 = 'none', 2 = '1–3', 3 = '4–7', 4 = '8–10', 5 = '11–15', 6 = '16–30' to 7 = '>30'.

Coordination flexibility can be effective; to a large extent, this depends on the resource flexibility (Sanchez, 1997). Resource flexibility could be considered to be a foundation of coordination flexibility. If a firm has a very strong resource flexibility, it will adjust the portfolio of resources efficiently to respond to the change in the environment and will find new opportunities that the environmental changes create. Therefore, we also control for this relation in our research model.

Reliability and Validity Analysis

First, this study utilises exploratory factor analysis (EFA) to examine the construct validity of firm strategic flexibility and its influence factors. Then, the factors are extracted using principal component analysis and selection criteria, of which the initial eigenvalue is greater than one and the maximum factor loading is over 0.6. Therefore, the network position items extract two factors in total, network centrality and tie strength, as expected. Specifically, the factor loadings of all items are greater than 0.6 and can explain a cumulative 72.67% of the variance. The absorptive capacity items are subdivided into two factors: knowledge acquisition capabilities and knowledge application capabilities. Similarly, these two factor loadings are greater than 0.8 and are accumulated to explain 79.84% of the variance. The two factors of strategic flexibility are also over 0.8, and they explain 77.07% of the variance. Additionally, we utilise confirmatory factor analysis (CFA) to test the construct validity of the relevant variables; consequently, good convergent validity and discriminant validity remain in the model. As noted, the coefficients of all of the items are greater than 0.5; at the same time, the Cronbach's α of all scales is over 0.7, which will be reduced if any item is omitted. From the analysis noted above,

the scales in our article have favourable reliability and validity. This study involves the analyses of the reliability and the validity of the variables, as shown in Table 2.

Results

The Pearson correlation is used to analyse all of the involved variables (refer to Table 3). Network centrality, tie strength, knowledge acquisition capabilities and knowledge application capabilities are all significantly correlated with resource flexibility and coordination flexibility.

The results of both the EFA and the CFA indicate that the measurement model developed in our article has suitable representativeness, which can be further documented in structural analysis. Based on the hypotheses noted above, we establish an initial structural equation model (Figure 1). This model incorporates sixteen exogenous manifest variables and estimates four exogenous latent variables, including network centrality, tie strength, knowledge acquisition capabilities and knowledge application capabilities. In addition, this model establishes six endogenous manifest variables to measure the two endogenous latent variables of resource flexibility and coordination flexibility. Three control variables containing the firm size, firm age and network size are also entered into this model. Thus, the initial structural equation model posits fifteen initial influence paths. The initial structural equation model is performed using AMOS 20, and the regression results are shown in Table 4. The value of χ^2 is 706.580 (df = 440), and the value of χ^2/df is 1.606, which is less than 2. Furthermore, the value of RMSEA is 0.050, which is less than 0.08. In addition, the coefficients of CFI and TLI are 0.937 and 0.925, respectively, which are both above the 0.9 level. As we can observe, the absolute fit indexes of χ^2/df and RMSEA, as well as the two relative fits of the CFI and TLI indices all fall inside the acceptable ranges. The fit results also indicate that there are 10 significant ($p < 0.05$) paths across variables, whereas the absolute value of C.R. in the other five paths is less than the criterion of 1.96, thus failing to verify the test.

Among all of the values of C.R. in the different paths presented in Table 4, the absolute value of C.R. in the path of 'Network Size → Resource Flexibility' is the minimum and least significant; therefore, it should be deleted. Once again, data are imported into and assessed by AMOS. Then, the results demonstrate that the overall fitting effects of the adjusted model are slightly improved; furthermore, either the absolute fitting indexes or relative fitting indexes fall inside the acceptable ranges. However, currently, four paths with worse significance levels that need further adjustment still exist. After the repetitive operation noted above, four paths are deleted in total, and the fitting results are reported in Table 5. Eventually, we find that each fitting index in the adjusted model satisfies our fitting requirements and has a favourable goodness of fit. Table 5 presents the results of this study. The results show that H1, H2, H3, H5a, H6a and H6b are supported by the empirical data, while H4 and H5b are not supported by the empirical data.

Table 3

Means, Standard Deviations, Correlations and Scale Reliabilities.

Variables	*Mean*	*S.D.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. Firm Age	15.13	12.04									
2. Firm Size	3.010	0.871	0.225 **								
3. Network Size	4.289	1.314	0.042	0.276 **							
4. Network Centrality	4.592	1.006	0.076	0.232 **	0.364 **	**(0.816)**					
5. Tie Strength	4.789	1.050	0.069	0.260 **	0.348 **	0.293 **	**(0.890)**				
6. Knowledge Acquisition capabilities	5.038	1.082	0.056	0.274 **	0.370 **	0.405 **	0.358 **	**(0.866)**			
7. Knowledge Application capabilities	4.889	1.097	0.054	0.276 **	0.362 **	0.463 **	0.428 **	0.464 **	**(0.878)**		
8. Resource Flexibility	4.686	1.052	0.010	0.246 **	0.445 **	0.516 **	0.528 **	0.487 **	0.486 **	**(0.843)**	
9. Coordination Flexibility	4.776	1.119	0.050	0.229 **	0.352 **	0.356 **	0.412 **	0.315 **	0.529 **	0.500 **	**(0.856)**

Notes: $N = 276$; ** $p < 0.01$; two-tailed test; internal reliabilities (Cronbach's α) for the overall constructs are given in parentheses on the diagonal. The bold on the diagonal is the square root of average variance extracted.

FIGURE 1

The Initial Structural Equation Model to Test the Influences of Strategic Flexibility.

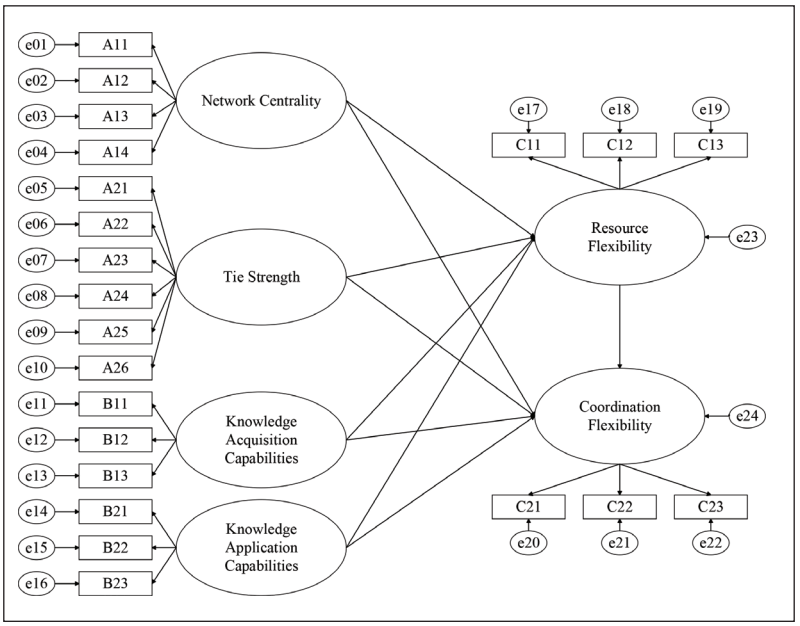

TABLE 4

The Fitting Results of Influences of Firm Strategic Flexibility in Initial Model.

Paths			*Path Coefficients*	*Standardised Path Coefficients*	*C.R.*	*P*
Network centrality	→	Resource flexibility	0.467	0.471	3.970	***
Tie strength	→	Resource flexibility	0.276	0.265	2.525	*
Knowledge acquisition capabilities	→	Resource flexibility	0.169	0.162	2.235	*
Knowledge application capabilities	→	Resource flexibility	0.031	0.033	0.441	0.659
Network centrality	→	Coordination flexibility	–0.442	–0.422	–2.306	*
Tie strength	→	Coordination flexibility	–0.050	–0.046	–0.351	0.726
Knowledge acquisition capabilities	→	Coordination flexibility	0.495	0.449	4.613	***
Knowledge application capabilities	→	Coordination flexibility	0.538	0.541	5.698	***
Resource flexibility	→	Coordination flexibility	0.301	0.285	1.426	0.154

(*Table 4 continued*)

(*Table 4 continued*)

Paths			*Path Coefficients*	*Standardised Path Coefficients*	*C.R.*	*P*
Firm size	→	Resource flexibility	0.236	0.244	4.252	***
Firm age	→	Resource flexibility	0.340	0.414	5.207	***
Network size	→	Resource flexibility	0.114	0.118	1.987	*
Firm size	→	Coordination flexibility	0.402	0.464	5.766	***
Firm age	→	Coordination flexibility	–0.004	–0.056	–1.093	0.274
Network size	→	Coordination flexibility	0.021	0.021	0.277	0.781
χ^2		706.580				
df		440				
χ^2/df		1.606				
CFI		0.937				
TLI		0.925				
RMSEA		0.050				

Notes: $N = 276$; *** $p < 0.001$; * $p < 0.05$.

Table 5

The Fitting Results of Influences of Firm Strategic Flexibility in Final Model.

Paths			*Path Coefficients*	*Standardised Path Coefficients*	*C.R.*	*P*
Network centrality	→	Resource flexibility	0.498	0.502	4.585	***
Tie strength	→	Resource flexibility	0.256	0.246	2.370	*
Knowledge acquisition capabilities	→	Resource flexibility	0.180	0.173	2.583	**
Network centrality	→	Coordination flexibility	–0.514	–0.486	–2.861	**
Knowledge acquisition capabilities	→	Coordination flexibility	0.481	0.434	4.504	***
Knowledge application capabilities	→	Coordination flexibility	0.556	0.556	5.977	***
Resource flexibility	→	Coordination flexibility	0.349	0.328	1.938	†
Firm size	→	Resource flexibility	0.223	0.231	4.132	***
Firm age	→	Resource flexibility	0.337	0.413	5.239	***
Network size	→	Resource flexibility	0.119	0.124	2.121	*
Firm size	→	Coordination flexibility	0.406	0.467	5.831	***
χ^2		649.628				
df		414				
χ^2/df		1.569				
CFI		0.944				
TLI		0.933				
RMSEA		0.048				

Notes: $N = 276$; *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.1$

Discussion and Conclusion

The outbreak of COVID-19 and a series of global crisis derived from the pandemic have had a dramatic impact on various companies, the strategic flexibility presented a relative new perspective to investigate the causes of the different performance during the global crisis. This study examines the different internal and external factors affecting local firms' strategic flexibility from an integrated social network and absorptive capacity perspective, which are noticeably absent in the current literature. The results of this study demonstrate that by occupying a central and strong-tie-abundant network position, local firms can gain more resource flexibility; and the absorptive capacity possessed by a local firm plays an active role in coordination flexibility. This study helps to better understand the antecedents of strategic flexibility from an integrated perspective, providing local firms with practical references about how to take advantage of GPNs to effectively construct strategic flexibility in a turbulent environment. Our results make three main theoretical contributions as follows.

First, this study contributes to the literature on the GPN from local firms' perspective by proposing that the position in a GPN is in accordance with the absorptive capacity and could help local firms improve their strategic flexibility in coping with a turbulent environment. Incorporating both a social network and an absorptive capacity perspective, we find that the major source of local firms' resource flexibility is the network position, in contrast to the internal absorptive capacity, as a major source of coordination flexibility.

Second, our results deepen the general strategic flexibility literature (Brozovic, 2018; Miroshnychenko et al., 2021) by verifying the positive impacts of a central and strong-tie-abundant network position on the resource flexibility while confirming that a central network position has a negative effect on the coordination flexibility. However, a strong-tie-abundant network position has no effect on the coordination flexibility. Perhaps, this case results from the mediating effect of resource flexibility, which interferes with the influence of the tie strength on the coordination flexibility. Most importantly, centrally located local firms are subject to 'information funnel' effects. Although higher network centrality enables local firms to take an active part in the GPNs, these firms suffer from more potential vulnerability information and pressure, which are easily attacked by competitors (Madhavan & Prescott, 1995). Each relation is often deemed to be a potential opportunity to identify the signals of strategic intentions; however, it may also become an information funnel, giving away information to competitors unconsciously. In other words, it is the local firm's network centrality that prevents the firm from recognising market opportunities and redeploying innovation resources to implement innovation projects.

Finally, our article contributes to the general strategic flexibility literature by introducing the absorptive capacity perspective (e.g., Miroshnychenko et al., 2021). On the one hand, our results reveal that the absorptive capacity positively affects the coordination flexibility. Knowledge acquisition capabilities better encourage organisations to take advantage of the access to others' knowledge and

skills to imitate and apply. Moreover, there are embedded business and personnel exchanges that grow when firms acquire knowledge, which greatly accelerates both the transformation and application of knowledge and skills between partners. Consequently, firms enlarge their knowledge scope and grasp the know-how of resource utilisation. Furthermore, the coordination flexibility essentially refers to identifying and seizing chances, as well as taking less time and spending less money when responding to environmental changes. In this respect, by applying both internal and external knowledge and information, strong knowledge application capabilities promote the flexible collocation of firms' resources and information and then significantly enhance innovation achievements and profits.

The practical implications for local firms are obvious. The roles of social networks and absorptive capacity in local firms' strategic flexibility are identified, and the results indicate that by occupying a central and strong-tie-abundant network position, local firms can gain more resource flexibility. Therefore, the local firms should actively be entering into GPNs, building a wide range of inter-firm cooperation with their partners in the networks, and try to be at the core of, or in a higher position in the networks. Local firms should upgrade to be the standard makers, core suppliers, general agents, and so on. They should also work with their partners to establish a solid and long-term relationship. Absorptive capacity possessed by a local firm plays an active role in coordination flexibility. Local firms should invest in R&D, and emphasise the information and knowledge exchange with external partners in GPNs. Organisational learning should also be encouraged to improve the effects of absorbing external information and knowledge.

In the future research, it has the potential to explore the factors affecting strategic flexibility. On the one hand, the advantages of China's Internet industry provide a rich context for digital innovation. It will have important theoretical and practical significance to explore how late developing enterprises make use of the opportunity window brought by digital technology reform and achieve transcendence by improving strategic flexibility. On the other hand, there is a significant trend in the current management research, especially from psychology and decision sciences (Fernández-Pérez et al., 2016). Such studies will help us to better understand the influence of individual characteristics on the behaviour and capability of firms in the dynamic environment.

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